One Company's Experience with Hearing Loss Prevention: An Overview

Mining Hearing Loss Prevention Workshop – September 26, 2006

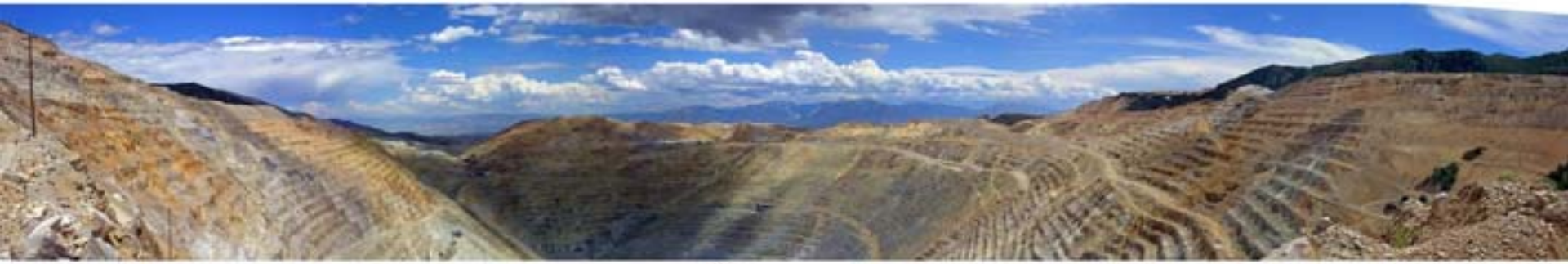
Todd Peterson
Senior Health and Safety Advisor
Kennecott Utah Copper

Today's Presentation

- Introduction to Rio Tinto / Kennecott Utah Copper.
  - Who are Rio Tinto and Kennecott Utah Copper?
  - Kennecott Utah Copper's Bingham Canyon Mine.

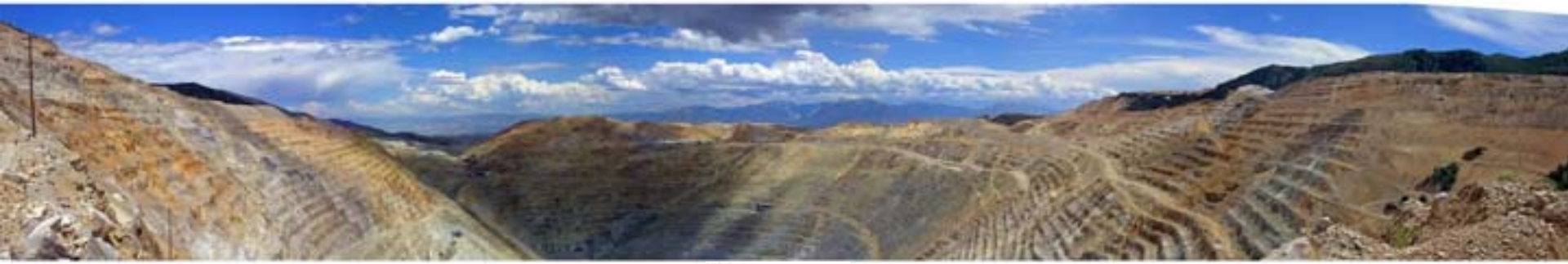
- Hearing Conservation Program at Bingham Canyon.
  - Program Overview.
  - The Challenge – Hearing Loss Prevention.

- Prevention Activities – Controlling the Cab Environment.
  - Rio Tinto Requirements.
  - Purchasing Specifications for new Equipment.
  - In-cab Communication Head-sets.



Who are Rio Tinto and Kennecott Utah Copper?

- Rio Tinto is:
  - A Global Mining Company with over 40 mining operations in North/South America, Europe, Africa, Asia and Australia.
  - Rio Tinto introduced twelve (12) corporate safety standards in 2000 and sixteen(16) corporate health standards in 2003 – including – Hearing Conservation.
- Kennecott Utah Copper is:
  - Approximately 1,700 employees working at six (6) operating facilities – Bingham Canyon Mine, Copperton Concentrator, Smelter, Refinery, Power Plant and Tailings Impoundment.
  - Four(4) facilities – Bingham Canyon Mine, Copperton Concentrator, Power Plant and Tailings Impoundment are under MSHA jurisdiction.
  - Two(2) facilities- Smelter and Refinery are under Utah-OSHA jurisdiction.
  - KUCC Hearing Conservation Program is compliant with MSHA 30 CFR-Part 62 and OSHA 29 CFR 1910.95.

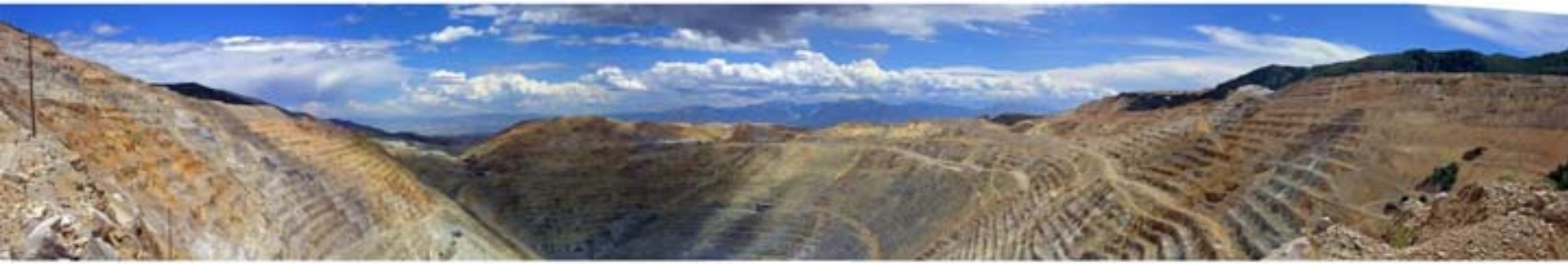


Who are Rio Tinto and Kennecott Utah Copper?

- Kennecott Utah Copper is:

  A mining company that annually produces approximately:

  278,000 tons of copper cathode,
  512,000 oz. of gold,
  4,200,000 oz. of silver,
  17,000 tons of molybdenum,
  1,722 tons of lead carbonate,
  220 tons of selenium.



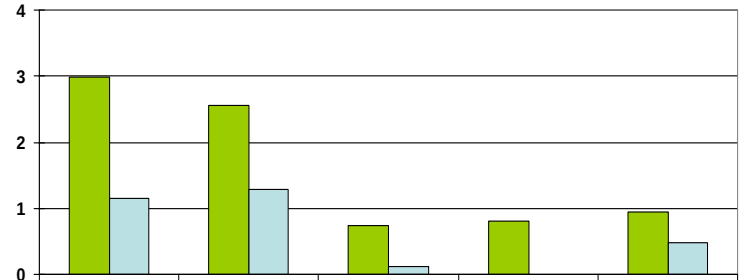

Kennecott Utah Copper's Bingham Canyon Mine
Kennecott
Utah Copper

Kennecott Utah Copper's Bingham Canyon Mine

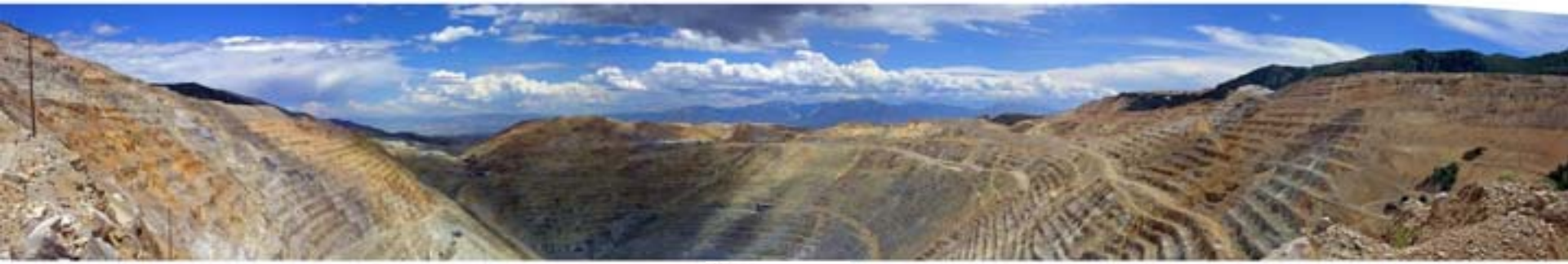
- Improving Safety Performance:
  - 738 Mine employees and 150 contractors.
  - Safely producing approximately 550,000 tons of ore and waste rock daily.
  - 58% reduction in LTIFR(2001-05).
  - 84% reduction in AIFR(2001-05).

Safety Statistics - Bingham Canyon Mine

Employees and Contractors



	2001	2002	2003	2004	2005
AIFR	2.98	2.56	0.73	0.8	0.95
LTIFR	1.15	1.28	0.12	0	0.48

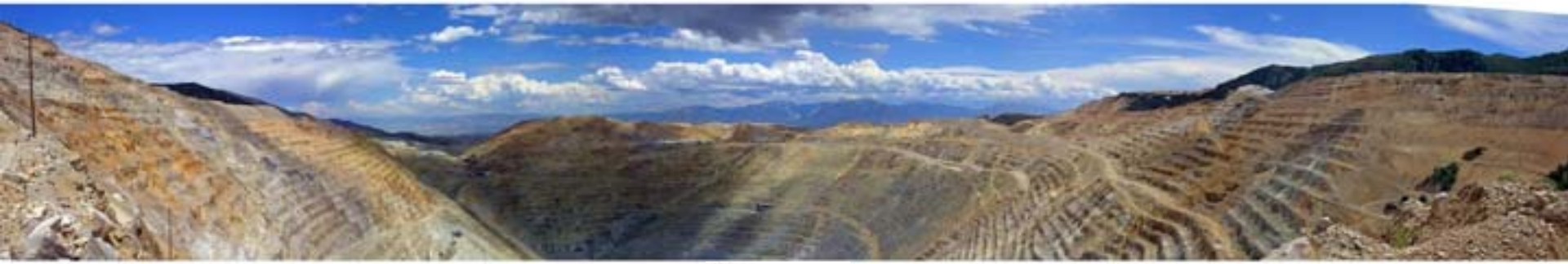


Hearing Conservation Program at Bingham Canyon

Kennecott Utah Copper

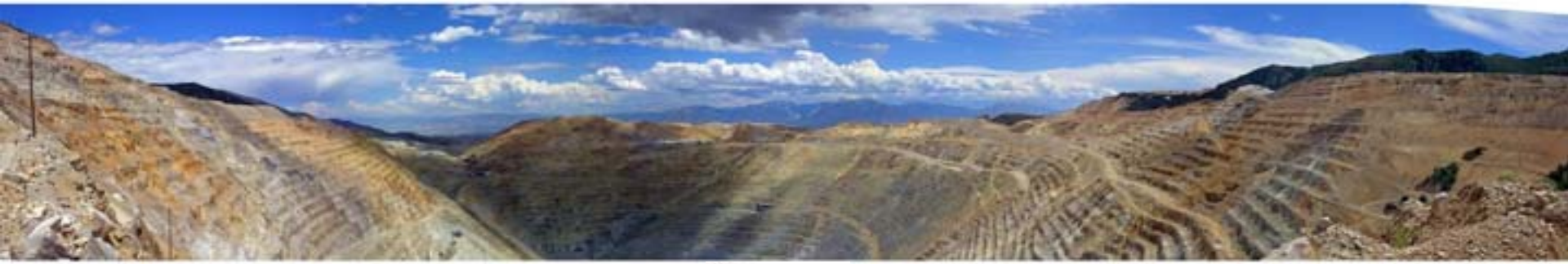
Hearing Conservation Program at Bingham Canyon

- Program Overview:
  - KUCC Occupational Exposure Limits:
    - 8-hr. shift – 85 dB(A).
    - 12-hr. shift - 82 dB(A).
  - Noise Monitoring:
    - 3dB(A) Exchange rate.
    - 80 dB(A) Threshold.



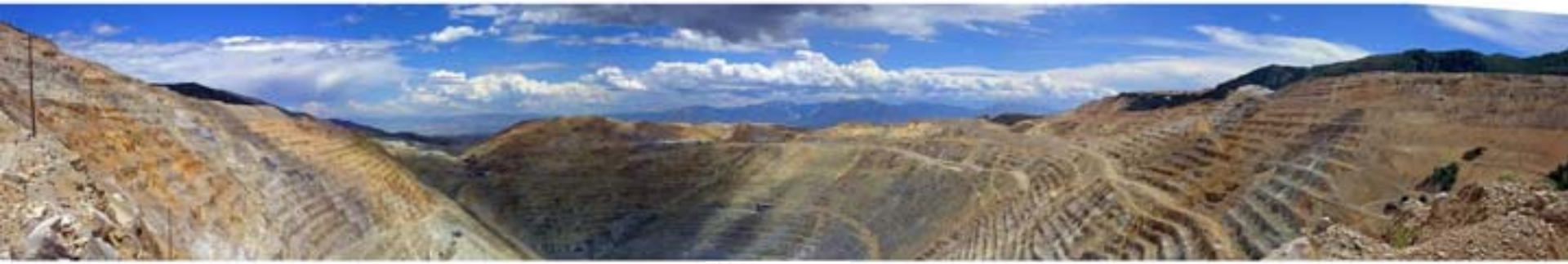
Hearing Conservation Program at Bingham Canyon

- Program Overview cont.
  - All 738 Mine employees are grouped into six(6) separate Similar Exposure Groups (SEG's).
    - Mine Operations
    - Field Maintenance
    - Technical Services
    - Truck Shop
    - Utility
    - Administration.
  - The largest number of Mine employees reside in the Mine Operations SEG.
    - Of this number (in Mine Operations) - 355 of 463 employees operate haul trucks and/or road equipment.



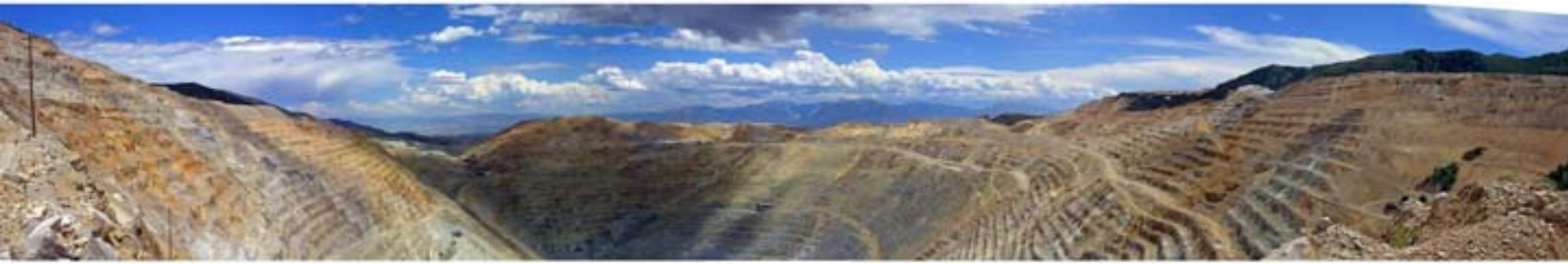
Hearing Conservation Program at Bingham Canyon

- The Challenge – Hearing Loss Prevention:
  - Average noise exposure to haul truck drivers/heavy equipment operators is 87 dB(A). (with a 95% UCL of 94 dB(A))
  - Contributors to the noise levels in the operator's cab include:
    - Equipment operation – engine noise, equipment function.
    - Overall condition and age of equipment - noise dampening considerations/door window seals, etc.
    - Windows- condition and status – up or down.
    - Radios – Two-way radio communications & AM/FM/satellite radio.



Hearing Conservation Program at Bingham Canyon

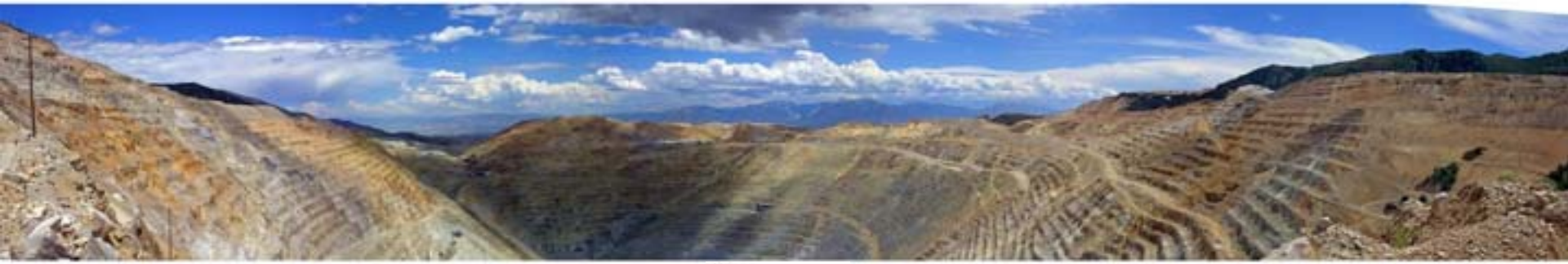
- The Challenge – Hearing Loss Prevention:
  - Haul trucks – under "normal" operating conditions the noise level in a cab of a Caterpillar or Komatsu haul truck is typically at 79-80 dB(A).
  - Additional sources of noise inside the cab <u>significantly increase</u> the operators measured exposure…
    - to hear the AM/FM radio above the established background noise levels – the volume is typically set above 80 dB(A).
    - for effective communication with Mine production control, the two-way radio is now adjusted to decibel levels above the AM/FM radio
    - cab windows down for personal preference and/or AC performance.



Hearing Conservation Program at Bingham Canyon

- The Challenge – Hearing Loss Prevention:
  - Effects of Additional Noise Sources:
    - Cab – 79 dB(A)
    - AM/FM radio - 82 dB(A)
    - Two –way radio – 84 dB(A)

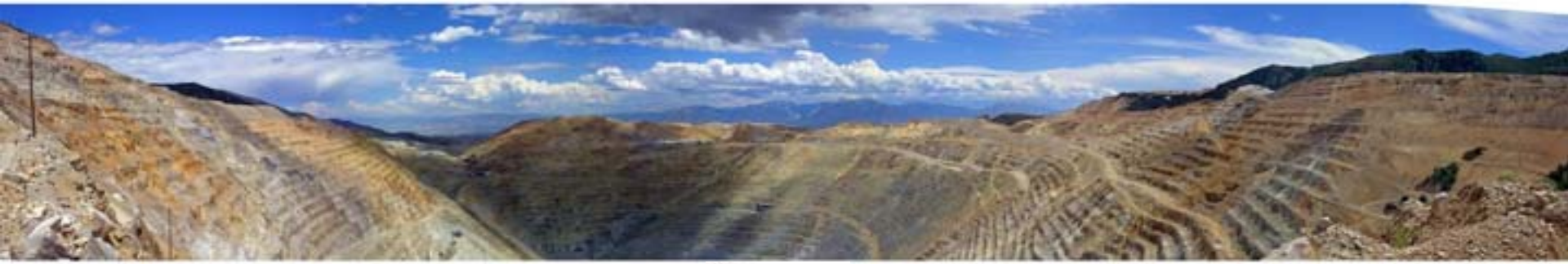
Total SPL = $10 \log \sum 10^{79/10} + 10^{82/10} + 10^{84/10}$ = **86.8 dB(A)**




Prevention Activities –Controlling the Cab Environment.
Kennecott
Utah Copper

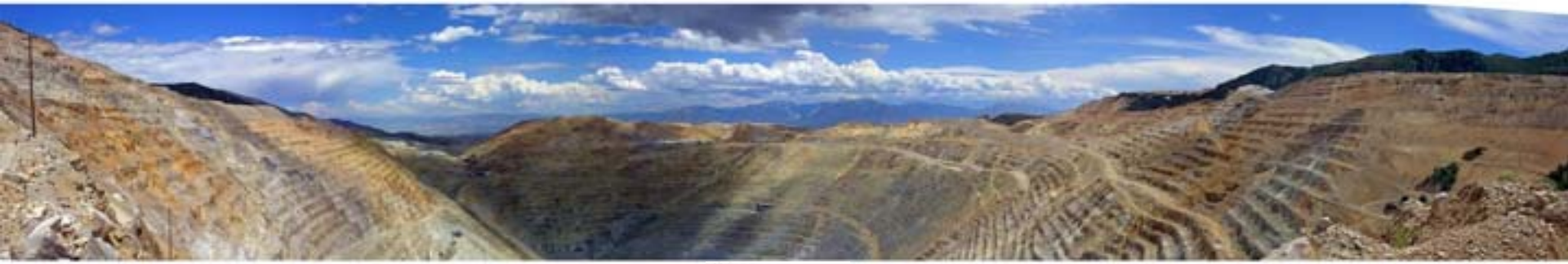
Prevention Activities – Controlling the Cab Environment.

- Rio Tinto Requirements
  - In 2004 Rio Tinto established global health targets for noise reduction to reduce the risk of NIHL.
    - 20% reduction in the number of employees exposed to noise levels above 85 dB(A) – TWA.
    - No employee exposed to noise above 82 dB(A) – TWA, with regard to HPD's
  - To meet this target, KUCC has established a yearly reduction target of 5% to align with the 20% reduction specified by Rio Tinto by 2008.

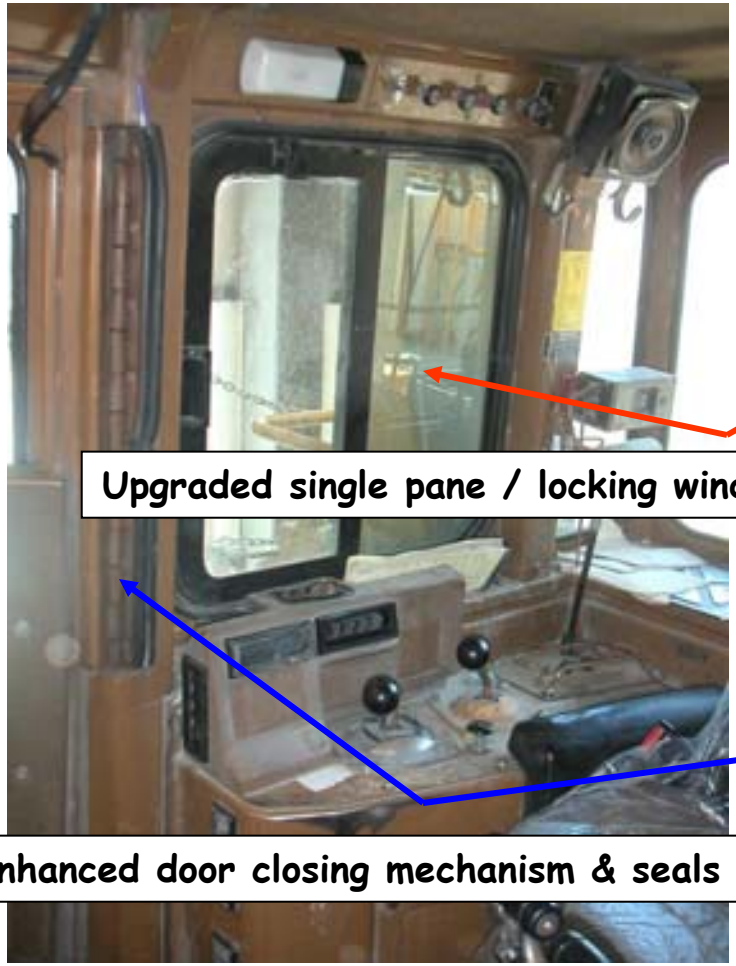


Prevention Activities – Controlling the Cab Environment.

- Purchasing Specifications for new Equipment
  - Rio Tinto has established HSE specifications for mobile equipment including performance based criteria for limiting noise exposure.
    - 80dB(A) sound level limit at the operator's ear position based on an exposure time of 12hrs.
    - The sound level limit shall be achieved with equipment under power with the doors and windows closed, and in-cabin radios turned off.
    - Equipment manufacturer shall provide certificates of compliance at commissioning.



Prevention Activities – Controlling the Cab Environment.



Upgraded single pane / locking window design

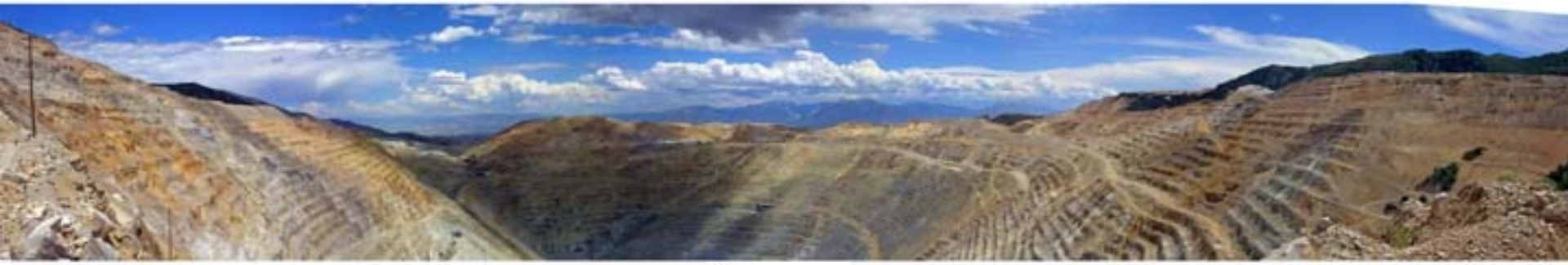
Enhanced door closing mechanism & seals

Typical Dozer Cab

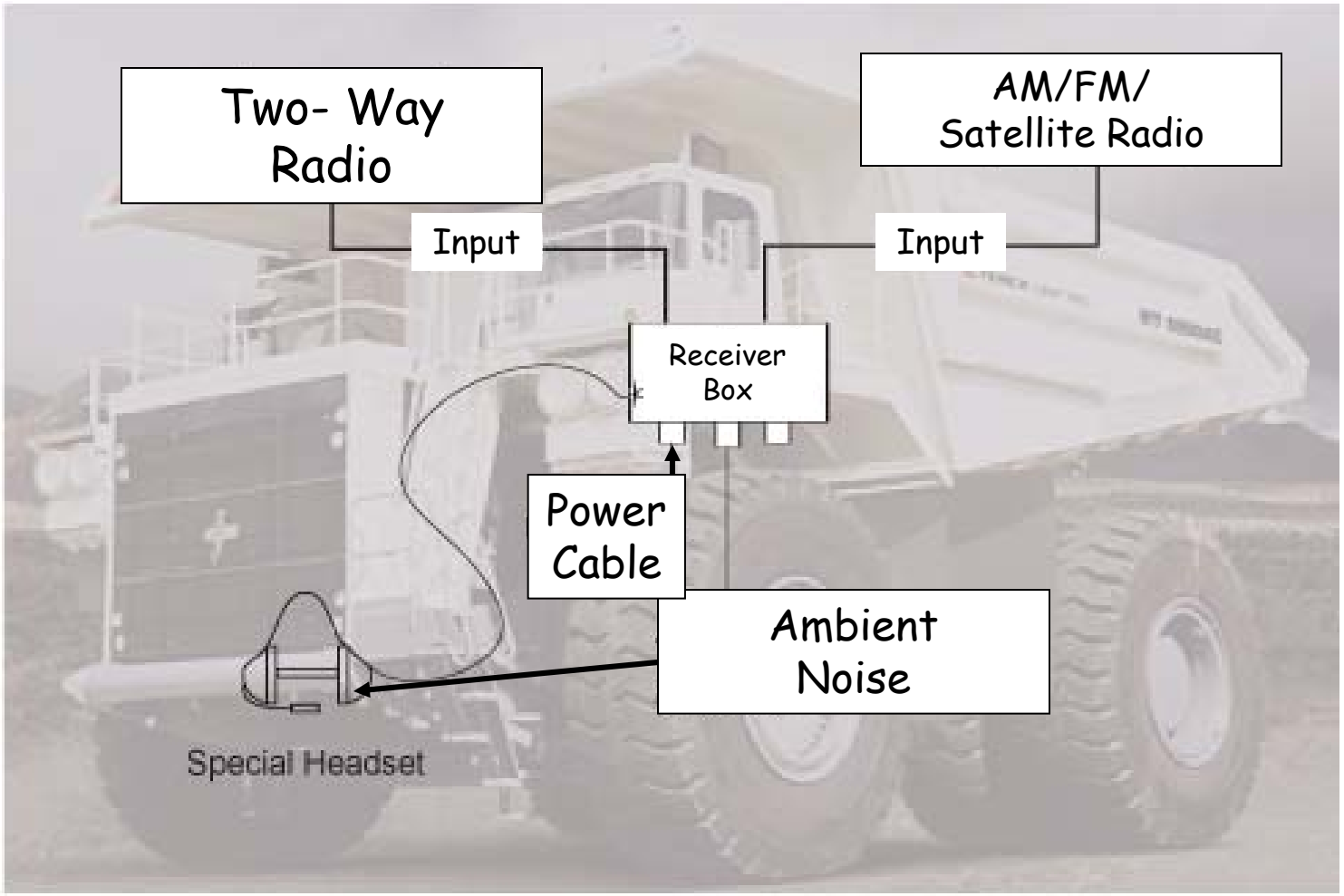
Upgraded Dozer Cab

Prevention Activities – Controlling the Cab Environment.

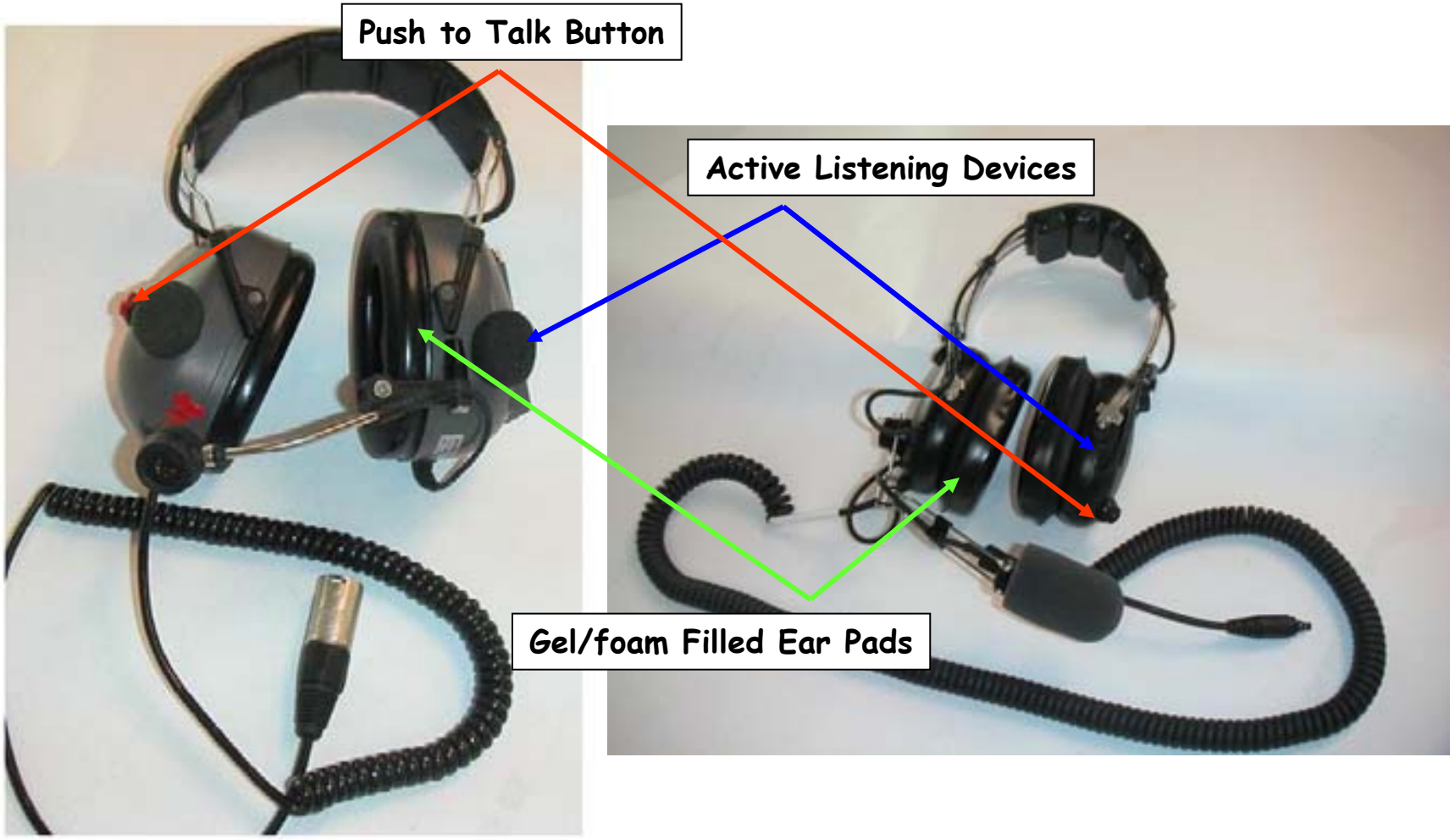
- Cab Communications – Headsets
  - Headsets are designed for a single operator, are attached to a receiver box that limits noise level output (to the operator) to a maximum of 82 dB(A).
  - Inputs include the Two-way & AM/FM/satellite radios to the receiver and sources of ambient noise to the headset.



Cab Communication Head-sets: System Diagram



In Cab Communication: Head-sets

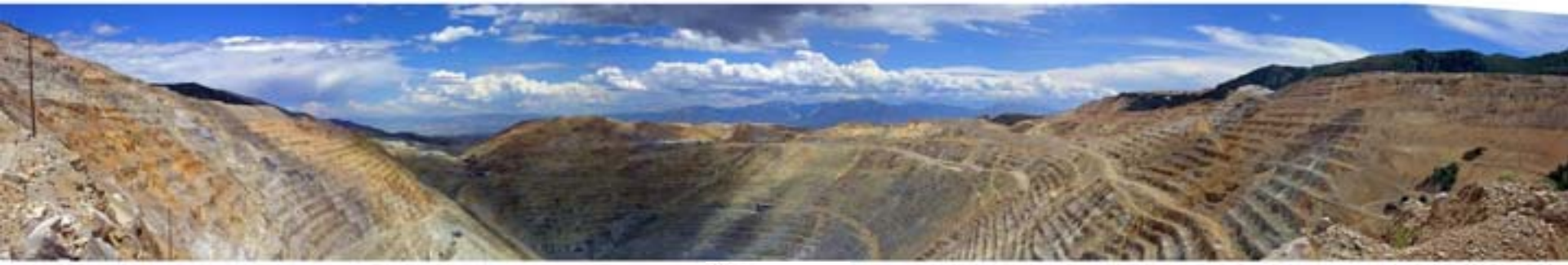


Peltor

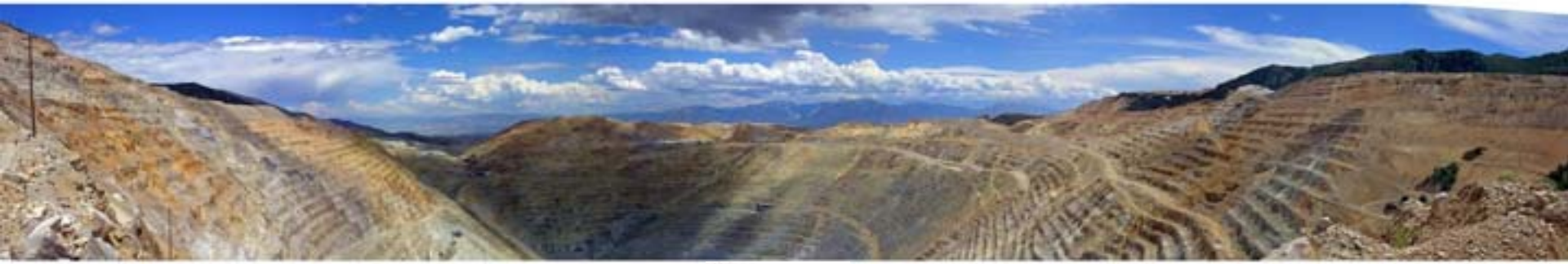
David Clark

Prevention Activities – Controlling the Cab Environment.

- Cab Communications – Headset Program at Bingham Canyon.
  - David Clark and Peltor Headset Systems are installed in four(4) haul trucks – Caterpillar and Komatsu.
  - Approximately Twenty-five(25) haul truck drivers have worn the headsets and participated in the evaluation program.
  - Technical and personal preference issues have impacted headset performance.
  - The current round of headset performance testing is scheduled through September.
  - Next step: Formalize results of the headset evaluation, identifying modifications and determine the feasibility of outfitting the heavy equipment fleet.



Questions ?



Kennecott Utah Copper